March 1989 Vol. XIV No. 3

ENDANGERED SPECIES

Technical Bulletin

Department of the Interior, U.S. Fish and Wildlife Service, Washington, D.C. 20240

Chimpanzees Proposed for Reclassification to Endangered

The chimpanzee (*Pan troglodytes*) and the pygmy chimpanzee (*Pan paniscus*), closely related species currently listed by the U.S. Fish and Wildlife Service as Threatened, have been proposed for reclassification to the more critical category of Endangered (F.R. 2/24/89). This proposed rule would reclassify wild populations of *P. troglodytes*; however, captive animals of this species would remain classified as Threatened, and those in the United States would continue to be covered by a special regulation that allows current legal uses. In the case of *P. paniscus*, both wild and captive populations would be reclassified to Endangered.

The historical range of *P. troglodytes* encompassed all or parts of at least 25 countries from Senegal to Tanzania, a distribution that corresponds closely with the tropical forest belt of equatorial Africa. Indeed, the chimpanzee is usually dependent on areas of unbroken forest, although it apparently is not uniformly distributed throughout such areas. The related species, *P. paniscus*, is found only in the forests of central Zaire.

A petition to reclassify *P. troglodytes* as Endangered was submitted to the Service in late 1987 by the Jane Goodall Institute, World Wildlife Fund, and Humane Society of the United States. The petition, accompanied by a detailed report from the Committee for Conservation and Care of Chimpanzees, cited evidence that the status of this species has continued to decline since it was listed in 1976 as Threatened. (See feature in BULLETIN Vol. XIII, No. 4.) Massive destruction of forest habitat (primarily from logging and slash-and-burn agriculture), population fragmentation, excessive local hunting, and international trade are blamed for the deteriorating status of both species. Wild populations of *P. troglodytes* have been reduced to a small fraction of their original size, and the species has disappeared entirely from 5 countries. *Pan paniscus*, the rarer of the two chimpanzee species, faces threats similar to those that have decimated its relative. With Africa's burgeoning human population and the increasing accessibility of modern weapons, the outlook for survival of chimpanzees in the wild is uncertain.

The ways in which chimpanzees of the species *P. troglodytes* would be regulated by the Service if the reclassification is approved depends on whether the ani-

(continued on page 4)

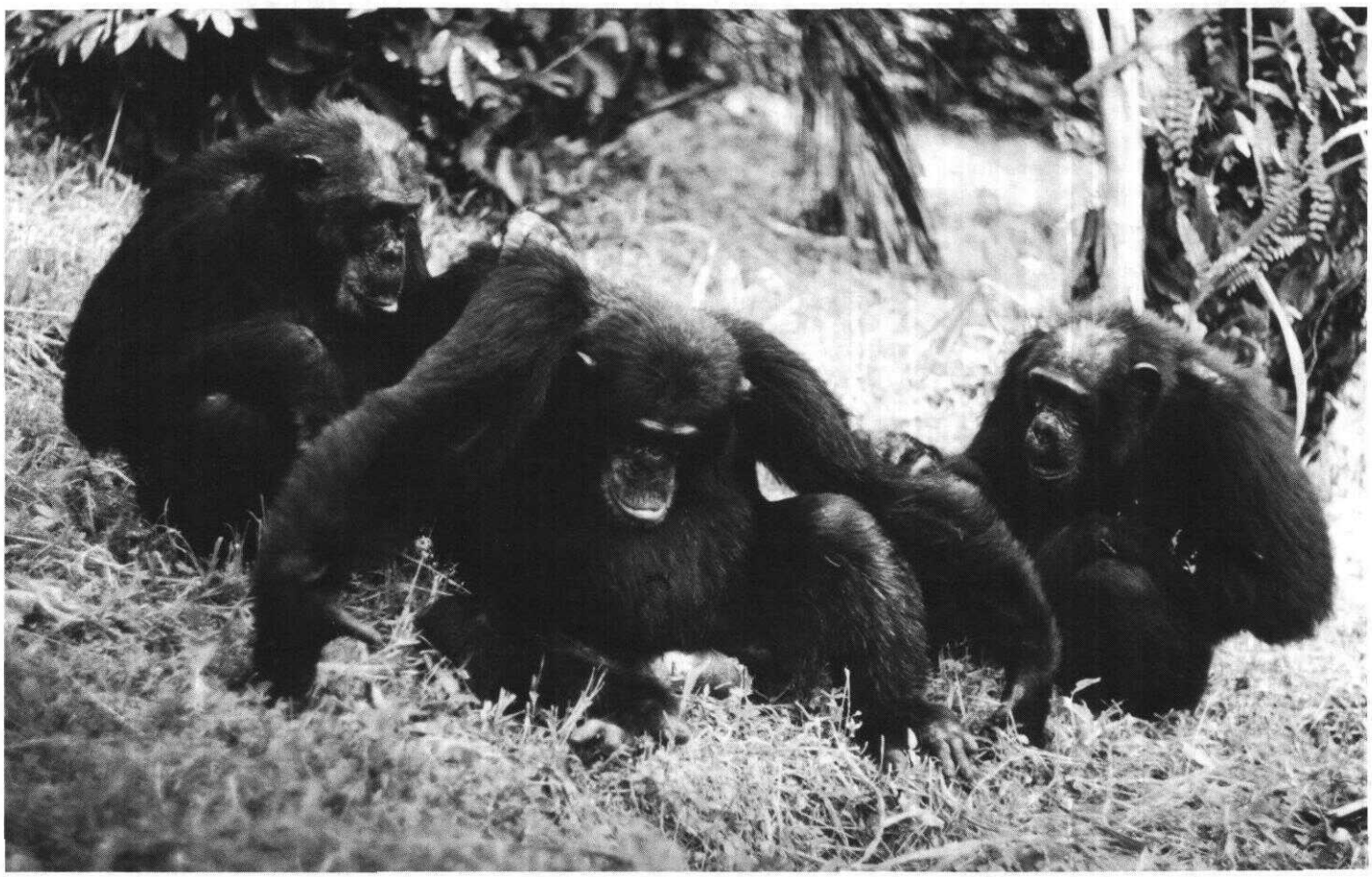
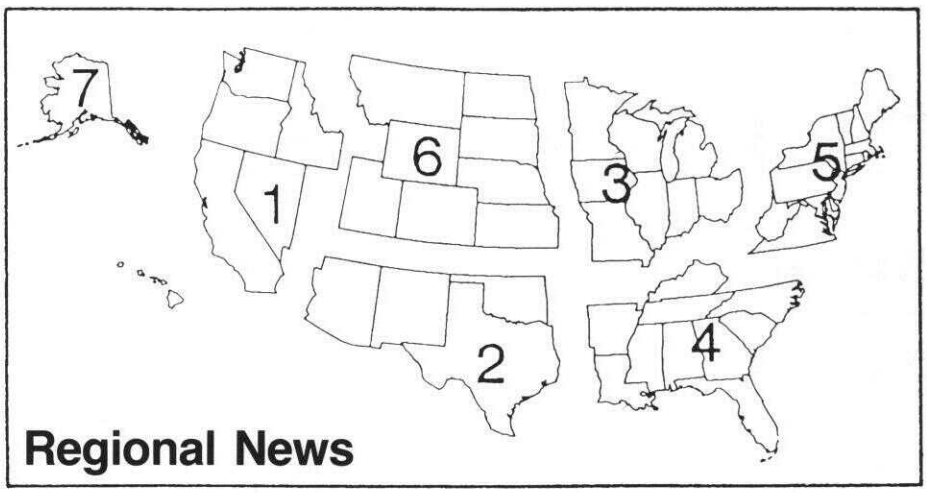


photo by Geza Teleki, courtesy of World Wildlife Fund-U.S.

The proposal to reclassify chimpanzees in the wild as Endangered would recognize the continuing decline of these primates in their equatorial African forest habitat.



Regional News

Regional endangered species staffers have reported the following news from February:

Region 1 — At the urging of the Fish and Wildlife Service (Service), the Monterey (California) County Regional Park District recently acquired a key parcel of beach-sand dune habitat that supports the Endangered Smith's blue butterfly (*Euphilotes enoptes smithi*). It is hoped that continued cooperative efforts of local government, private landowners, and the Service can protect a major portion of the remaining sand dune ecosystem that is vital to the recovery of the species.

* * *

The California Department of Fish and Game has discovered a new population of the Endangered Owens tui chub (*Gila bicolor snyderi*) near Owens Lake in Inyo County, California. Service representatives have met with State biologists and the property owner, Anheiser-Busch, to develop a plan to protect the spring habitat. For the present, chubs will be removed to nearby holding ponds to increase their numbers. The State proposes to eradicate competing fish in the spring, after which the chubs will be returned.

* * *

Region 4 — Shelta Cave in Huntsville, Alabama, was once known as one of the most unique caves in North America because it supported such a diverse and complex assemblage of species. A survey of this cave was conducted recently to determine the presence of several aquatic species. The presence of the Endangered Alabama caveshrimp (*Palaemonias alabamae*), known only from this and one other site, could not be reconfirmed. However, a single specimen of a very small, undescribed crayfish under review as a listing candidate was observed. This troglodytic species is known only from Shelta Cave, and this observation is the only confirmed sighting since November 1973. The numbers of two other troglodytic crayfishes, *Cambarus jonesi* and *Orconectes australis australis*, were very low compared to studies done 15 years ago.

* * *

The intensive harvesting of freshwater mussels in Arkansas by commercial shellers during 1988 has increased concern for these animals. If the harvesting continues at its current level, mussel populations will be adversely affected. To help address this problem, the Arkansas Game and Fish Commission conducted a series of four workshops for Commission personnel. Workshop topics included: the mussel resource and harvest in Arkansas; the range of the Endangered fat pocketbook (*Potamilus capax*), pink mucket (*Lampsilis orviculata*), and speckled pocketbook (*Lampsilis streckeri*) mussels in Arkansas; how the Endangered Species Act listing, consultation, and recovery processes work; a discussion of endangered species law enforcement situations; and mussel life history and taxonomy.

* * *

Region 5 — The Service hosted a meeting of representatives and managers involved in the recovery effort for the Endangered Atlantic coast population of the piping plover (*Charadrius melodus*). The meeting was attended by over 75 representatives of Federal and State agencies, private conservation organiza-

(continued on page 4)

U.S. Fish and Wildlife Service
Washington, D.C. 20240

Susan Recce Lamson, *Acting Director*
(202-343-4717)
Ralph O. Morgenweck
Assistant Director for Fish and Wildlife Enhancement
(202-343-4646)
William E. Knapp, *Chief,*
Kenneth B. Stansell, *Deputy Chief,*
Division of Endangered Species and Habitat Conservation
(703-358-2161)
Marshal P. Jones, *Chief,*
Office of Management Authority
(703-358-2093)
Clark R. Bavin, *Chief,*
Division of Law Enforcement
(703-358-1949)

TECHNICAL BULLETIN

Michael Bender, *Editor*
(703-358-2166)

Regional Offices

Regional 1, Lloyd 500 Bldg., Suite 1692, 500 N.E. Multnomah St., Portland, OR 97232 (503-231-6118); Marvin Plenert, *Acting Regional Director;* Robert P. Smith, *Assistant Regional Director;* Jay Watson, *Chief, Division of Endangered Species and Habitat Conservation.*

Region 2, P.O. Box 1306, Albuquerque, NM 87103 (505-766-2321); Michael J. Spear, *Regional Director;* James A. Young, *Assistant Regional Director;* Steve Chambers, *Endangered Species Specialist.*

Region 3, Federal Bldg., Fort Snelling, Twin Cities, MN 55111 (612-725-3500); James C. Gritman, *Regional Director;* Gerald R. Lowry, *Assistant Regional Director;* James M. Engel, *Endangered Species Specialist.*

Region 4, Richard B. Russell Federal Bldg., 75 Spring St., S.W., Atlanta, GA 30303 (404-331-3580); James W. Pulliam, *Regional Director;* John I. Christian, *Deputy Assistant Regional Director;* David Flemming, *Endangered Species Specialist.*

Region 5, One Gateway Center, Suite 700, Newton Corner, MA 02158 (617-965-5100); Ronald E. Lambertson, *Regional Director;* Ralph Pisapia, *Assistant Regional Director;* Paul Nickerson, *Endangered Species Specialist.*

Region 6, P.O. Box 25486, Denver Federal Center; Denver, CO 80225 (303-236-7920); Galen Buterbaugh, *Regional Director;* Robert E. Jacobsen, *Assistant Regional Director;* Larry Shanks, *Endangered Species Specialist.*

Region 7, 1011 E. Tudor Rd., Anchorage, AK 99503 (907-786-3542); Walter O. Stieglitz, *Regional Director;* Rowan Gould, *Assistant Regional Director;* Ron Garrett, *Endangered Species Specialist.*

Region 8 (FWS Research and Development nationwide), Washington, D.C. 20240; Richard N. Smith, *Regional Director;* Al Sherk, *Endangered Species Specialist (703-358-1710).*

U.S. Fish and Wildlife Service Regions

Region 1: California, Hawaii, Idaho, Nevada, Oregon, Washington, American Samoa, Commonwealth of the Northern Mariana Islands, Guam, and the Pacific Trust Territories. **Region 2:** Arizona, New Mexico, Oklahoma, and Texas. **Region 3:** Illinois, Indiana, Iowa, Michigan, Minnesota, Missouri, Ohio, and Wisconsin. **Region 4:** Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Puerto Rico and the U.S. Virgin Islands. **Region 5:** Connecticut, Delaware, District of Columbia, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, Virginia and West Virginia. **Region 6:** Colorado, Kansas, Montana, Nebraska, North Dakota, South Dakota, Utah, and Wyoming. **Region 7:** Alaska. **Region 8:** Research and Development nationwide. **Region 9:** Washington, D.C., Office.

THE ENDANGERED SPECIES TECHNICAL BULLETIN is published monthly by the U.S. Fish and Wildlife Service, Department of the Interior, Washington, D.C. 20240.

Implementing the African Elephant Conservation Act

Frank McGilvrey
Office of Management Authority
Washington, D.C.

Since passage of the African Elephant Conservation Act on October 7, 1988 (see BULLETIN Vol. XIII, No. 11-12), the Fish and Wildlife Service has been moving aggressively to fulfill its goal of perpetuating healthy wild populations of African elephants (*Loxodonta africana*).

Populations of the African elephant have fallen dramatically over the past decade, from an estimated 1.5 million in 1979 to no more than 750,000 today. The extensive illegal trade in ivory is blamed for much of this decline. African elephants are listed by the United States as Threatened, and the species is on Appendix II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). Special permits are available for limited import of African elephant ivory into the U.S. provided that certain conditions, as detailed in 50 CFR 17.40(e), are met.

On December 27, 1988, the Service published a notice in the *Federal Register* announcing a moratorium on all ivory imports into the U.S. from nations and other entities that are not parties to CITES, as required by Sections 2201 and 2202 of the African Elephant Conservation Act. The ban applies to all imports of raw and worked ivory from non-CITES countries, whether they are ivory producing nations (those within the range of the African elephant) or intermediary nations (those that trade in ivory originating in another country). The Act makes an exception for sport hunted trophies; their import is not prohibited from non-CITES nations, provided that these countries have established an ivory export quota with the CITES Secretariat in Switzerland.

The list of nations subject to the initial moratorium on commercial ivory imports includes:

Albania
Andorra
Angola
Antigua and Barbuda
Antilles
Aruba
Bahrain
Barbados
Bhutan
Brunei
Bulgaria
Burkina Faso
Burma
Cambodia
Cape Verde
Chad
Comoros
Cook Islands
Cuba
Czechoslovakia
Dijibouti
Dominica
Equatorial Guinea
Ethiopia
Fiji
Gabon
Greece
Grenada
Guinea-Bissau
Haiti
Iceland
Iraq
Ireland
Ivory Coast
Jamaica
Kiribati
North Korea
South Korea
Kuwait
Laos
Lebanon
Lesotho
Libya
Maldives
Mali
Malta
Mauritania
Mexico
Mongolia
Namibia
Nauru
Netherlands
New Zealand
Oman
Poland
Qatar
Romania
St. Christopher and Nevis
St. Vincent and the Grenadines
San Marino
Sao Tome and Principe
Saudi Arabia
Sierra Leone
Solomon Islands
Swaziland
Syria
Taiwan
Tonga
Turkey
Tuvalu
Uganda
United Arab Emirates
Vanuatu
Vatican City
Vietnam
Western Samoa
Yemen Arab Republic
Yemen, People's Democratic Republic of Yugoslavia

The ivory import moratorium was extended to the Democratic Republic of Somalia, and any country accepting ivory from Somalia, by an emergency rule published in the February 24, 1989, *Federal Register*. This rule, which took effect immediately, was the result of information in a petition filed by the World Wildlife Fund. The petition alleges that in the past 3 years, Somalia exported over 21,100 tusks. Somalia's 1986 annual report to CITES declares that in 1986 alone, it exported 16,986 tusks representing some 9,440 elephants. In its report and other

(continued on next page)

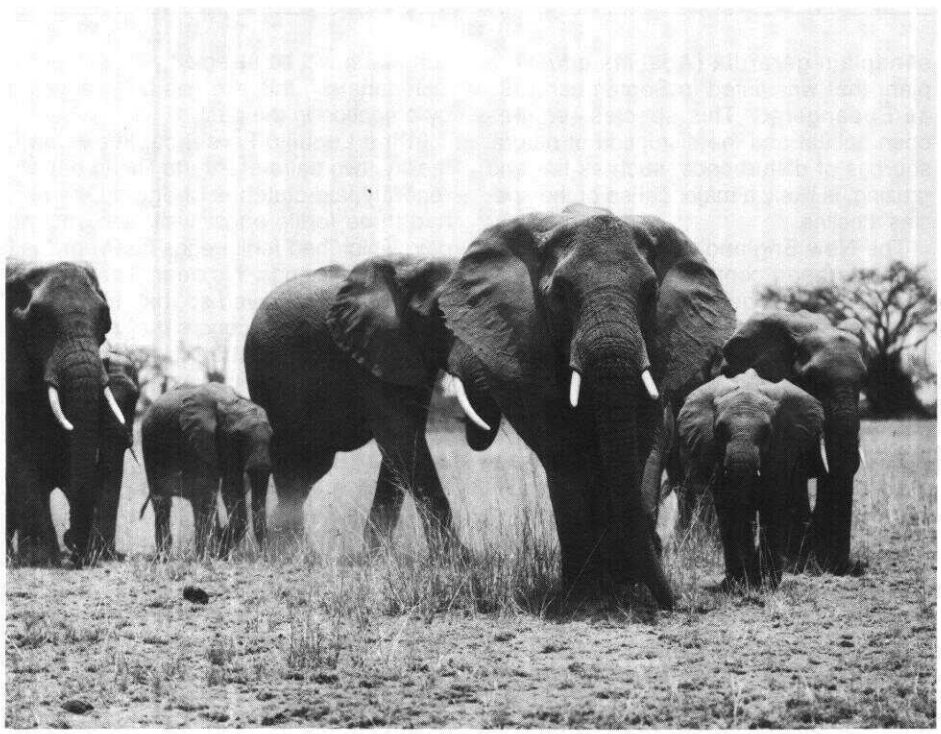


photo by Norman Myers, courtesy of World Wildlife Fund-U.S.

African elephant populations have fallen by more than 50 percent in the past decade.

Elephants

(continued from previous page)

statements, Somalia declared all tusks to be confiscated items and of Somali origin despite the fact that Somalia's native elephant population in 1987 was estimated to be no more than 4,500 animals and was no more than 8,600 in 1985. Somalia thus has declared exports of domestic ivory during the last 3 years representing roughly three times the number of elephants estimated to have been living in that country in 1987. Available information indicates that ivory is being imported into Somalia from Kenya and Ethiopia. Kenya prohibits the take of elephants and Ethiopia, which is not a party to CITES, allows only a very limited number of elephant trophy hunts.

In conjunction with this emergency notice, the Service asked for public comments on the information submitted by the World Wildlife Fund. Comments should be sent to the Office of Management Authority, U.S. Fish and Wildlife Service, Washington, D.C. 20240, by April 25, 1989. The import moratorium on Somalian ivory will remain in effect pending further review of the petition and subsequent comments.

In a related matter, the Service published a February 3 *Federal Register* notice requesting information on the African elephant conservation program of each ivory producing country. After the closing date of June 5, 1989, the Service will review all comments and determine whether each of the 34 ivory producing countries are in compliance with the Act. A moratorium on any further import of ivory will be enacted against any country not meeting the requirements of the Act. The Assistant Secretary of the Interior for Fish and Wildlife and Parks also is sending a letter, through the State Department, to each of the ivory producing countries asking for the necessary information.

A meeting of the CITES Standing Committee, chaired by the U.S., was held the last week of February. Among the major issues discussed was how to deal with over 30 tons of ivory confiscated by Burundi. Burundi agrees that if they are allowed to sell the ivory, all proceeds will go into conservation programs, as required by the Act.

Chimpanzees

(continued from page 1)

mals are in the wild or in captivity, where captive animals are being held, and whether or not they are still being taken from the wild. These chimpanzees would fall into one of four general management categories:

1) In the wild, chimpanzees would be listed as Endangered.

2) Chimpanzees held in captivity within the countries where wild populations still occur, and any chimpanzees removed from the wild after the effective date of the final rule (no matter where they are held), would be classified as Threatened *but* would be regulated by the Service as if they were Endangered. The same would apply to the progeny of such animals (except for the offspring of chimpanzees legally imported into the U.S.). Regulating these chimpanzees as if they were Endangered would prohibit their import into the U.S. except under Federal permit for approved scientific purposes or for enhancing the propagation or survival of the species (as detailed in 50 CFR 17.22). The regulations emphasize that such permits are available only for purposes that are consistent with the goals of the Act to conserve listed species and their habitats.

3) Chimpanzees that currently are held in captivity outside of their native range and outside of the U.S. would continue to be classified and regulated as Threatened species. Import of such animals would be somewhat less restrictive. The conditions under which these chimpanzees could be imported into the U.S. would be widened to include educational purposes, zoological exhibition, and other "special purposes consistent with the purposes of the Act." (See 50 CFR 17.32.) Again, however, import permits would be available only for purposes that comply with the conservation goals of the Act.

4) Those captive chimpanzees being held within the U.S. would remain classified as Threatened, and current legal uses of these animals would continue to be allowed under special regulation, as detailed in 50 CFR 17.40(c)(2).

In the U.S., there are groups of captive *P. troglodytes* large enough to be maintained independently over the long term. There has been no major legal importation of chimpanzees into the U.S. for about a decade, but some people have become concerned that the demand for these animals in biomedical research will soon increase.

Regional News

(continued from page 2)

tions, and universities, as well as Parks Canada and the Canadian Wildlife Service. Presentations covered preliminary results of ongoing research projects and summaries of major management efforts at several nesting areas, including the use of predator exclosures to protect piping plovers nests.

* * *

The National Fish and Wildlife Foundation has awarded a grant of $15,000 to Region 5 to develop an educational video on the piping plover. The video will highlight the problems faced by this species along the Atlantic coast, and describe the management and protection efforts being undertaken by the Service and other agencies and organizations.

* * *

The Service has contracted with The Nature Conservancy to conduct a 2-year study on the effects of vegetation removal and soil disturbance on germination of the sandplain gerardia (*Agalinis acuta*), a plant that was listed in September 1988 as Endangered. This species requires open habitat and the disruption of natural sources of disturbance, such as fire and grazing, is likely a major cause of the species' decline.

The New England Wildflower Society also has been contracted for 2 years to develop techniques to propagate the sandplain gerardia in a cultivated setting. It is hoped that this work will provide seed for further experiments on the effects of disturbance (thus reducing the need to risk experimentation with the few wild populations), furnish a source of seeds for seed banking, and enhance our understanding of this plant's biology.

* * *

Region 8 — Thirty-four Puerto Rican parrots (*Amazona vittata*) remain in the wild in the Caribbean National Forest. The count was made by the Puerto Rico Research Group and volunteers from the Student Conservation Association on January 18. Some parrots were observed near the Cacique nest site, a good indication that it will be selected again in 1989. Unfortunately, this site has been affected by predation in the past.

In the Luquillo Forest captive rearing facility, two pairs of Puerto Rican parrots recently laid clutches of eggs. One pair had three fertile eggs, while the second pair, which had fertile eggs last year, had four infertile eggs this year. The infertile eggs will be removed so that the second pair produces a second set of eggs. This year's egg production is much further along than in previous years.

The three fertile eggs were placed in the aviary incubator on January 8, and on January 16 the first Puerto Rican parrot of the 1989 breeding season hatched from this clutch. Two more chicks subsequently hatched, bringing 1989's production up to three birds as of March 5.

* * *

During early January in the Superior National Forest of northern Minnesota, male gray wolf (*Canis lupus*) number 6041 was killed by a neighboring wolf pack that had invaded the territory of its

(continued on page 8)

Four Species Proposed for Listing Protection

Four rare species—two animals and two plants—were proposed by the Fish and Wildlife Service in February for addition to the List of Endangered and Threatened Wildlife and Plants. If the listings are approved, these species will receive protection under the Endangered Species Act:

Pygmy Sculpin (*Cottus pygmaeus*)

This small fish, which rarely exceeds 1.8 inches (45 millimeters) in total length, is known only from Coldwater Spring and 500 feet (152 meters) of its outflow in Calhoun County, Alabama. The spring is impounded to form a shallow pool of over one acre (0.4 hectare) in size and serves as the primary water supply for the city of Anniston.

For the past 6 years, the pygmy sculpin has been protected under a conservation agreement between Anniston, which owns the pool and its outflow, and the Fish and Wildlife Service. However, several potential threats to the water quality of the Coldwater Spring system have been identified. Because of these additional threats and the species' extremely restricted range, the Service has proposed to list the pygmy sculpin as Threatened (F.R. 2/7/89).

The use and/or storage of toxic chemicals at the nearby Anniston Army Depot may be contaminating the spring recharge zone. Test wells at the depot have revealed high levels of trichloroethylene, and this substance has been detected in Coldwater Spring. Other pollutants present at the test wells also may be migrating through the aquifer. If the pygmy sculpin is listed, the Environmental Protection Agency and the Department of Defense will consult with the Service on any clean-up activities that may affect the species.

Another threat to the watershed is the proposed construction of a highway bypass from Interstate 20 to Anniston. The preferred route identified during early project planning would pass along the side of Coldwater Mountain immediately above and to the east of Coldwater Spring. Any accidental toxic spills from this proposed route could quickly contaminate the spring. Two alternate routes, though within the recharge area, would not pose as great a threat. If the pygmy sculpin is listed, the Federal Highway Administration will consult with the Service to ensure that the species' well-being is considered during route selection.

Because the water withdrawals by Anniston do not threaten the pygmy sculpin, a final listing rule would include a special provision allowing the city continued use of Coldwater Spring.

Cracking Pearly Mussel (*Hemistena (=Lastena) lata*)

This freshwater mollusk has a thin, elongated, brownish-green shell. It inhabits free-flowing streams where it imbeds itself in gravel riffles and feeds by filtering food particles from the water. Like most other mussels, this species has a complex reproductive cycle in which the mussel larvae parasitize fish. Because the cracking pearly mussel is so rare, its host fish and other aspects of its life history are unknown.

The cracking pearly mussel historically was distributed fairly widely in the Ohio, Cumberland, and Tennessee River systems within the States of Indiana, Illinois, Kentucky, Tennessee, Alabama, and Virginia. Today, however, it is known to occur only in a few shoals of the Clinch, Powell, and Elk Rivers in Virginia and Tennessee. It is possible that a few individuals also may survive in the Green River (Kentucky) and Tennessee River (Tennessee). All of the remaining populations are geographically isolated from each other, and it is likely that all but the Clinch River population have fallen below the size considered sufficient to maintain long-term genetic viability. Because this species is believed to be in danger of extinction, the Service has proposed to list it as Endangered (F.R. 2/17/89).

The decline of the cracking pearly mussel resulted from widespread modification and degradation of its clean, free-flowing aquatic habitat. Coal mining and other disturbances within the watershed caused many of the mussel shoals to become degraded by silt. Other riffle habitat has been flooded by impoundments and disturbed by dredging. At least two mussel die-offs were traced to toxic spills from riverside industrial plants. Because mussel larvae depend on fish hosts, often of a particular species, habitat problems that decrease the diversity and abundance of fish can indirectly harm mussels as well. These impacts are not restricted to the cracking pearly mussel; all of the sites inhabited by this species are shared with other mussels already listed as Endangered.

Palma de Manaca (*Calyptroma rivalis*)

An arborescent palm, *C. rivalis* can reach up to 40 feet (12 m) in height. This species is endemic to the island of Puerto Rico, where it grows along streambanks in the semi-evergreen seasonal forests of the northwestern karst region. Only two natural populations of fewer than 250 trees in total are known, although the species could have been more widely distributed prior to the conversion of many forests to agricultural lands. The Service has proposed to list *C. rivalis* as a Threatened species (F.R. 2/7/89).

Unless the *C. rivalis* sites are conserved, continued agricultural expansion could threaten the species' survival. Even the palms that are not destroyed during land clearing can be affected indirectly. Fires set in surrounding sugar cane fields in preparation for harvest have spread into *C. rivalis* habitat and burned some individuals. Also, cattle have been observed feeding and trampling on seedlings. Seedling establishment is further hampered by flash floods, which have increased in number and intensity after the deforestation of surrounding lands. Because the species is restricted to streamside habitat, it is particularly vulnerable to flooding.

The Puerto Rico Department of Natural Resources is concerned about the survival of *C. rivalis* and has introduced a small number of cultivated seedlings into Rio Abajo Commonwealth Forest. Although the transplant efforts appear to have been successful initially, it is not yet known if the palms will reproduce and colonize the area naturally.

Small-anthered Bittercress (*Cardamine micranthera*)

A perennial herb in the mustard family (Brassicaceae), the small-anthered bittercress grows up to about 16 inches (40 centimeters) high and produces small white flowers. It is endemic to moist sites along a few small streams in the piedmont region of North Carolina. The type localilty in Forsyth County was destroyed in the early 1960's by conversion of the site to a cattle pasture, and the species was believed for almost 30 years to be extinct. In 1985, however, a population of *C. micranthera* was discovered in Stokes County. Since then, intensive searches by Service and State biologists have located two additional populations, both of them also in Stokes County. *Cardamine micranthera* was proposed on February 1 for listing as Endangered.

All three populations are small in numbers of plants and extent of occupied habitat. The smallest population consists of only 3 plants and the largest, which numbers about 200 plants, is concentrated along less than 0.1 mile (160 m) of a streambank. The sites are privately owned and thus subject to changes in management. Threats to the species' survival include: conversion of habitat to improved pasture; habitat destruction and/or dessication associated with logging; encroachment by such aggressive nonnative species as the Japanese honeysuckle (*Lonicera japonica*); impoundment or channelization of the small stream corridors it inhabits; and scouring of streamside habitat by floods.

(continued on page 7)

Concern Grows For Light-footed Clapper Rail

James W. Wiley[1] and Richard Zembal[2]

The light-footed clapper rail (*Rallus longirostris levipes*) is a reclusive resident of dense marsh vegetation in coastal regions of southern California and northern Baja California, Mexico. In California, this Endangered bird currently occupies only a handful of remnant saltmarshes from Santa Barbara County south to the Tijuana Marsh on the U.S./Mexico border.

Historical accounts suggest that the rail once was common in southern California. Since early in the twentieth century, however, this subspecies has experienced a severe population decline. By 1972-1973, when Fish and Wildlife Service biologist Sanford Wilbur conducted the first extensive surveys, only 250-350 pairs of light-footed clapper rails remained in California. Despite additional rails found through improved censusing techniques and more complete coverage of populations in later years, the numbers of rails detected from 1980 to 1986 showed an average annual decline of 29.6 percent. From 1984 to 1985, the population plummeted 48.7 percent. In 1986, a total of 143 pairs of light-footed clapper rails survived within the United States.

Although the rail's decline has resulted from several environmental factors, all are ultimately linked to habitat destruction or degradation. In 1971, biologist John Speth estimated that 67 percent of California's coastal saltmarshes had been lost because of past and current land uses. Habitat loss has been most severe in southern California, where only about 25 percent of the coastal wetlands that existed in 1900 remain. The sites occupied by rails currently total only about 3,000 acres (1,215 hectares) or about 35 percent of the remaining coastal marshland. Light-footed clapper rails have been found in 21 southern California marshes in recent years. However, 88.1 percent of the State's rails inhabit only 6 marshes, and only 5 marshes were used by breeding rails in 1986.

In addition to the direct loss of coastal wetlands, several other threats face the light-footed clapper rail. The remnant marshes are vulnerable to storm-driven tides and runoff, which disrupt rail nesting habitat and probably reduce food supplies. High tides force rails into artificially-created dry edge areas where they can be killed by introduced predators, such as red foxes, cats, and dogs. A severe winter storm could damage remnant wetland areas and devastate their rail populations. Dredge and fill operations also have altered the remaining marshes, making the rails more vulnerable to predation. Another potential threat is the high concentration of environmental contaminants in some southern California marshes.

Research Needs

Largely through the efforts of Richard Zembal and Barbara Massey, substantial knowledge has been accumulated on light-footed clapper rail ecology and behavior, research techniques, and conservation needs. Before the species can be recovered, however, additional research is needed on habitat requirements, habitat restoration and creation, population dynamics, and environmental contaminants.

To reclassify the bird to Threatened, the Light-footed Clapper Rail Recovery Plan (as revised in 1982) sets a goal of 800 pairs in 20 secure marshes totalling 10,000 acres (4,050 hectares). A substantial amount of additional marshland must be protected, and many existing marshes enhanced, to achieve this goal. This marshland then will need to be identified and ranked according to its potential as rail habitat. Habitat components critical to rail foraging, roosting, and breeding have to be identified for use in setting priorities for acquisition and restoration of marshlands. Water and vegetation management techniques that would improve the quality of marshlands and, thereby, the health of light-footed clapper rail populations also need to be developed.

Floating nesting platforms could be a short-term solution to the relative lack of suitable nesting habitat observed at many marshes. Vigilance will be needed, however, to ensure that any predators drawn by the conspicuousness of the rafts do not destroy rail nests. Trials conducted by Zembal in 1987 resulted in substantially increased breeding success by clapper rails using such platforms. This suggests that rail population growth in these areas is indeed limited by the availability of suitable nesting sites.

Light-footed clapper rails have been found to disperse from natal marshes. The frequency and importance of these movements to the genetic diversity of the southern California populations is unknown. If there is substantial gene flow among the populations, conservation strategies to preserve such genetic interchange should be developed. Dispersal may also allow individuals to move from temporarily or seasonally unsuitable sites to more suitable marsh habitat. Studies of rail dispersion using radio-tagged and color-marked birds are needed to shed further light on this behavior. Such studies also would provide information for development of reintroduction and/or translocation strategies.

During recent surveys, some small populations of clapper rails were found to be composed of only males or females. The cause of this imbalance is unknown, as are the effects of losing these populations as breeders. However, the dynamics of the ecosystem should be investigated to determine if breeding populations can be reestablished in these areas.

Also of recent concern is the finding of elevated DDE (a metabolite of the pesticide DDT) levels in clapper rail eggs in southern California. The significance of these elevated contaminant levels on

(continued on next page)

Photo by David Ledig

light-footed clapper rail

embryo viability has not yet been determined.

Cooperative Research

As part of a new cooperative research project between the Service's Patuxent Wildlife Research Center-Endangered Species Research Branch and the Laguna Niguel, California, Field Office, biologists will examine several of the problems identified above. Ecological criteria for ranking the suitability of coastal marshes for light-footed clapper rail reintroductions and restoration will be developed through literature reviews, consultations with experienced biologists, and on-site evaluations of areas currently and historically used by rails.

Using these criteria, recommendations will be developed for specific marshland acquisitions and restoration. Sites that are still suitable for rails, or that could be enhanced or restored as rail habitat, will be ranked in order of their importance to the bird's recovery. An assessment of development pressures facing the sites will be included in the evaluation.

The rail's population characteristics, dispersal dynamics, and population parameters (age/sex-specific mortality, survival, seasonal movements) will be determined over a 3-year period. Habitat used by marked birds will be monitored and characterized for physical and vegetative elements. Radio telemetry and conventional color marking techniques should allow observers to monitor the movements of individual rails intermittently. Emphasis will be placed on determining dispersal dynamics of marked birds. This information is vital for determining the definition of a light-footed clapper rail population (i.e., What is the extent of gene flow among rails in disjunct marshes?). If radio-marked birds disappear from natal marshes, searches will be conducted at other sites.

The nature of chemical residues (substances and concentrations) in light-footed clapper rail eggs will be determined as part of a broader study on the hatching success of rail eggs in nature. The number of eggs collected within any year and/or location will be restricted by the size of the local breeding population and the level of reproductive success. Samples will be analyzed at Patuxent's Environmental Contaminants Laboratory for standard chemical contaminants and heavy metals. Eggshells of collected eggs will be measured for thickness and compared with measurements of eggshells collected before the chemical pesticide era (1947 to present).

1. U.S. Fish and Wildlife Service, Patuxent Wildlife Research Center, Southwest Research Group, 2140 Eastman Avenue, Suite 100, Ventura, California 93003.
2. U.S. Fish and Wildlife Service, Laguna Niguel Field Office, 2400 Avila Road, Laguna Niguel, California 92677

Final Listing Rules Approved

Michael D. Rees
Division of Endangered Species and Habitat Conservation
Washington, D.C.

During February of 1989, Endangered Species Act protection was extended to two additional species:

Cooley's Meadowrue (*Thalictrum cooleyi*)

This small, rhizomatous, perennial herb in the buttercup family (Ranunculaceae) rarely exceeds 3.2 feet (1 meter) in height, has narrow, lance-shaped leaves, and small unisexual flowers that vary somewhat in color and lack petals. Cooley's meadowrue is endemic to the southeastern coastal plain, where it occurs on the edges of bogs and savannas. It depends on some form of periodic disturbance, such as fire, to maintain the open sites in which it occurs. Sixteen populations of the plant were reported historically from 7 counties in North Carolina and Florida; however, the species currently is known to occur in only 11 locations in North Carolina and 1 location in Florida. All 12 sites are in private ownership, with The Nature Conservancy owning part of one site in North Carolina.

Fire suppression and silvicultural and agricultural activities are believed largely responsible for extirpating one-fourth of the populations known historically. Other potential threats include mining, drainage, highway construction, and herbicide use. At least 11 of the remaining 12 populations are currently threatened by habitat alteration. All of the populations are small, which increases their vulnerability to extirpation. Cooley's meadowrue was proposed for listing as an Endangered species in the April 21, 1988, *Federal Register* (see BULLETIN Vol. XIII, No. 5), and the final rule was published on February 7, 1989.

Speckled Pocketbook Mussel (*Lampsilis streckeri*)

This freshwater mussel, about 3 inches (80 millimeters) in length, has a dark yellow or brown shell with chevron-like spots and rays. The mussel is found on coarse to muddy sand in streams up to 1.3 feet (0.4 meters) deep with a constant flow of water. It once occurred in the Little Red River and its tributaries in Arkansas, but is now limited to a stretch of about 6 miles (10 kilometers) in the Middle Fork of the Little Red River. Only a few hundred individuals are believed to remain in this stretch. Construction of an impoundment, cold water discharges from the reservoir, pollution, floods, and modifications of river channels for flood control have been implicated in the species' disappearance from other parts of the river system. The species remains vulnerable to water quality degradation. The low density of the existing population also decreases the likelihood of successful reproduction. The speckled pocketbook mussel was proposed for listing as an Endangered species in the July 25, 1988, *Federal Register* (see BULLETIN Vol. XIII, No. 8), and the final rule was published on February 28, 1989.

Listing Proposals

(continued from page 5)

Conservation Measures

Among the conservation benefits provided to a species if its listing under the Endangered Species Act is approved are: protection from adverse effects of Federal activities; restrictions on take and trafficking; the requirement for the Service to develop and implement recovery plans; the authorization to seek land purchases or exchanges for important habitat; and the possibility of Federal aid to State and Commonwealth conservation departments that have Endangered Species Cooperative Agreements with the Service. Listing also lends greater recognition to a species' precarious status, which encourages further conservation efforts by State and local agencies, independent organizations, and concerned individuals.

Section 7 of the Act directs Federal agencies to use their legal authorities to further the purposes of the Act by carrying out conservation programs for listed species. It also requires these agencies to ensure that any actions they fund, authorize, or carry out are not likely to jeopardize the survival of a listed species. If an agency finds that one of its activities may affect a listed species, it is required to consult with the Service on ways to avoid jeopardy. For species that are *proposed* for listing and for which jeopardy is found, Federal agencies are required to "confer" with the Service, although the results of such a conference are not legally binding.

Further protection is authorized by Section 9 of the Act, which makes it illegal to take, possess, transport, or engage in interstate or international trafficking in listed animals except by permit for certain conservation purposes. For plants, it is unlawful to collect or maliciously damage any listed species on lands under Federal jurisdiction. Removing or damaging listed plants on State and private lands in knowing violation of State law or in the course of violating a State criminal tresspass law also is illegal under the Act. In addition, some States have their own more restrictive laws specifically against the take of State or federally listed plants and animals.

Regional News

(continued from page 4)

pack. The male wolf had been radio-collared and monitored since 1980, was at least 10 years old, had out-lived at least two mates, and had produced a litter with a third mate in 1988.

The National Wildlife Health Research Center at Madison, Wisconsin, has found heartworm larvae in two gray wolves from the Superior National Forest, making a total of three cases identified in the past year. Each infected wolf has been in a different pack, but with adjacent territories.

* * *

Two sites in Arizona have been evaluated as possible masked bobwhite (*Colinus virginianus ridgwayi*) propagation facilities. After years of effort, the wild population in Arizona, mainly at Buenos Aires National Wildlife Refuge, is around 200 individuals. An unknown but very low number still exists in Mexico.

BOX SCORE OF LISTINGS AND RECOVERY PLANS

Category	ENDANGERED U.S. Only	ENDANGERED U.S. & Foreign	ENDANGERED Foreign Only	THREATENED U.S. Only	THREATENED U.S. & Foreign	THREATENED Foreign Only	SPECIES* TOTAL	SPECIES WITH PLANS
Mammals	31	19	240	5	2	23	320	24
Birds	61	15	145	7	3	0	231	57
Reptiles	8	7	59	14	4	14	106	22
Amphibians	5	0	8	4	0	0	17	5
Fishes	45	2	11	24	6	0	88	47
Snails	3	0	1	5	0	0	9	7
Clams	32	0	2	0	0	0	34	22
Crustaceans	8	0	0	1	0	0	9	4
Insects	10	0	0	7	0	0	17	12
Arachnids	3	0	0	0	0	0	3	0
Plants	152	6	1	40	6	2	207	84
TOTAL	358	49	467	107	21	39	1041	284 **

Total U.S. Endangered **407**
Total U.S. Threatened **128**
Total U.S. Listed **535**

Recovery Plans approved: 242

*Separate populations of a species that are listed both as Endangered and Threatened are tallied twice. Those species are the leopard, gray wolf, grizzly bear, bald eagle, piping plover, roseate tern, Nile crocodile, green sea turtle, and olive ridley sea turtle. For the purposes of the Endangered Species Act, the term "species" can mean a species, subspecies, or distinct vertebrate population. Several entries also represent entire genera or even families.

**More than one species are covered by some recovery plans, and a few species have separate plans covering different parts of their ranges. Recovery plans are drawn up only for listed species that occur in the United States.

Number of Cooperative Agreements signed with States and Territories: 51 fish & wildlife
March 31, 1989 36 plants

March 1989 **Vol. XIV No. 3**

ENDANGERED SPECIES

Technical Bulletin

Department of the Interior, U.S. Fish and Wildlife Service, Washington, D.C. 20240

FIRST CLASS
POSTAGE AND FEES PAID
U.S. DEPARTMENT OF THE INTERIOR
PERMIT NO. G-77